REMARKS/ARGUMENTS

In the Office Action dated January 15, 2004, the Examiner has rejected Claims 8 under 35 U.S.C. §102(e), and rejected Claims 1-3, 5, and 7 under 35 U.S.C. §103(a). The Examiner has kindly indicated that Claims 4, 6, and 9 would be allowable if rewritten in independent form, including all the limitations of the base claim and any intervening claims. By this paper, Claims 3 and 5 have been amended to more distinctly indicate that which Applicants regard as the invention, and Claims 4 and 9 have been rewritten in independent form (Claim 6 has been cancelled). Further, new sheets of drawings have been submitted to replace those corresponding drawing sheets originally submitted with this Application. For the reasons set forth below, Claims 1-5 and 7-9, as amended, the claims remaining in this Application, are now considered to be allowable.

Applicants' invention is directed to an edge enhancement processing system and method for modifying image data at certain pixel locations to include gray scale image data so as to reduce jaggedness in the image. An adjustable threshold device establishes a binary pixel value for an incoming current gray level pixel in accordance with a thresholding criterion. An operator accessible input to the thresholding device is used by the operator to adjust the threshold value in the thresholding criterion. A current binary pixel formed in accordance with the thresholding criterion and neighboring pixels also so formed in accordance with the thresholding criterion are examined in accordance with predetermined criteria for determining adjustment of the current pixel to a gray scale value to reduce edge jaggedness of the image. Generally, adjustment of the thresholding value is made in instances where under color removal and/or gray component replacement is employed. Such processing system is not shown or in any way taught in the prior art.

Claims 8 stands rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent 6,088,130 (Matsukubo, et al). The Matsukubo, et al. patent discloses an edge enhancement method for processing image data using under color removal and/or gray component replacement, and adjusting edge enhancement processing of the image data in according with whether or not under color removal and/or gray component replacement is used or the extent of such use. However, the Matsukubo, et al. patent shows the under color removal output and the filter output are two

separate and distinct outputs, and the coefficients of spatial filters are changed with regard to a character edge, character interior and screened dot/half-tone image. Coefficients are changed in dependence upon thickness with regard to character edges as well (note column 10, lines 35-39 of the reference). Accordingly, the filter coefficient that directs which spatial filter to use for edge enhancement, does not show dependency on the under color removal, but rather on image structure information. Furthermore, the Matsukubo, et al. patent discloses that with regard to color characters, all are subjected to possessing identical with that for black characters with the exception of the masking under color removal coefficients (note column 10, lines 41-43 of the reference). Therefore, the under color removal coefficient is directing the masking under color removal unit as to the amount of under color removal performed on the CMY input data, but is not affecting the filter function for edge enhancement. Thus, the Matsukubo, et al. patent does not in any way anticipate processing image data using under color removal and/or gray component replacement; and adjusting edge enhancement processing of the image data in accordance with whether or not under color removal and/or gray component replacement is used or the extent of such use, as specifically recited in Claim 8. The edge enhancement anti-aliasing methodology used in Applicants' invention described in this Application (see Figure 12 in the Application) is far more sophisticated so as to handle threshold modified image data (such as processing after UCR/GCR) than that of simple smoothing and sharpening filters (filtering functions) shown by Matsukubo, et al. These are important aspects of Applicants' invention. Therefore, it is respectfully submitted that this rejection is improper, and independent Claim 8 should now be allowed.

Claims 1 and 2 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent 5,920,646 (Kamon) in view of U.S. Patent 5,703,971 (Asimopoulos, et al.). Regarding Claim 1, Kamon teaches an edge enhancement processing system for modifying image data at certain pixel locations after binarization of the gray scale image data (19, 100 and 101 of Kamon Figure 2 and 3). The edge enhancement anti-aliasing image processing device disclosed by the applicants (see Figure 1 and 12 of current application as well as prior U.S. Patents 5,502,793 and 5,600,761 by the same Inventor for comparison) is quite different than

the edge enhancement processing system teaches by Kamon. Also, the Examiner has correctly pointed out that Kamon does not teach an adjustable threshold device with an operator accessible input to the threshold device for adjusting a threshold value in the threshold criteria as taught in applicant's independent Claim 1. Asimopoulos, et al. teaches a method and device to perform automatic optimization of black and white imaged created by a scanner. The device performs dynamic thresholding by approximating the information level and the background level at every pixel in the image, the threshold being calculated as a function of the background and information levels at that point, and a characterization process step comparing the pixel intensity at that point with the threshold, so an optimized binarized output is the result. Since the dynamic threshold is a function of both the background level and the information level and the threshold is changing dynamically from pixel to pixel, it is not an operator accessible input to the threshold device for adjusting a threshold value in the thresholding criterion as stated in applicant's Claim 1. Further more, the setting of the dynamic threshold value in Asimopoulos, et al. requires both the information level and background level of the image (Asimopoulos, column 3, lines 50-57), it is different than the way that the threshold value is selected here in the application (for example in later claims 3 and 7 when UCR/GCR are used – no background level information is required). Asimopoulos, et al. also did not teach anti-aliasing edge enhancement method or output data other than binary data. Accordingly, Applicant's invention would not be obvious to one of ordinary skill in the art in view of the cited references either individually or in any proper combination. Therefore, independent Claim 1, should now be allowed.

Regarding Claim 2, the Examiner has correctly pointed out that Kamon does not teach a step of determining an adjustable threshold value in a holding criterion in response to an input from an operator. With respect to Asimopoulos, et al., since the dynamic threshold is a function of both the background level and the information level, and the threshold is changing dynamically from pixel to pixel, it is not set by determining an adjustable threshold value in a thresholding criterion in response to an input from an operator as recited in Applicants' Claim 2. Furthermore, the setting of the dynamic threshold value in Asimopoulos et al. requires both the information level and background level of the image, witch is different than the way

that the threshold value is selected here in the instant Application. Asimopoulos, et al. also do not teach anti-aliasing edge enhancement method or output data other than binary data. Accordingly, Applicants' invention would not be obvious to one of ordinary skill in the art in view of the cited references either individually or in any proper combination. Therefore, independent Claim 2, should also now be allowed.

Dependent Claims 3, 5 and 7 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent 5,920,646 (Kamon) in view of U.S. Patent 5,703,971 (Asimopoulos, et al.) as applied to Claims 1 and 2, respectively, and further in view of U.S. Patent 5,974,171 (Hayashi, et al.). The Examiner points out that the combined teachings of Kamon and Asimopoulos, et al. are not directed to color separation image data that has been subjected to under color removal and/or gray component replacement (Claim 3) or a color transformation process (Claim 5) <u>before</u> being transformed into a binary pixel. Hiyashi, et al. teaches an edge enhancement method conducting edge enhancement or smoothing (see column 9, lines 21-22 of the reference) which operates on color separation image data that has been subjected to under color removal and/or gray component replacement and a color transformation process, also <u>before</u> being transformed into a binary pixel. In addition to the above arguments relative to Applicants' invention, as recited in Claims 1 and 2, being unobvious to one of ordinary skill in the art over the cited references to Kamon and Asimopoulos, et al., dependent Claim 3 and dependent claim 5 positively recite transforming image data via the adjustable threshold <u>into binary data first before the edge enhancement</u> anti-aliasing method. It should clearly be recognized that binary conversion prior to enhancement, according to Applicants' invention as claimed, is less complicated and provides better enhancing than filtering. Accordingly, Applicant's invention would not be obvious to one of ordinary skill in the art in view of the cited references either individually or in any proper combination. Therefore, amended dependent Claims 3 and 5, should now also be allowed.

Relative to dependent Claim 7, the Examiner stated that Asimopoulos, et al., as mentioned above regarding Claims 1 and 2, teach an adjustable threshold value which is determined in accordance with a selection by the operator, and Hayashi, et al., as mentioned above regarding Claims 3 and 5, teach color image processing that includes under color removal and/or gray component replacement. As

Applicants have distinctly pointed out above, the adjustable threshold value in Asimopoulos, et al. require both the information level and background level of the image (see Asimopoulos, et al., column 3, lines 50-57), which is different than the way that the threshold value is selected here in the instant Application. Accordingly, Applicants' invention would not be obvious to one of ordinary skill in the art in view of the cited references either individually or in any proper combination. Therefore, dependent Claim 7, should now also be allowed.

Claims 4 and 9 have been amended so as to be presented in independent form as suggested by the Examiner. Accordingly, Claims 4 and 9, as amended, should now be allowed.

Applicants are not aware of any additional patents, publications, or other information not previously submitted to the Patent and Trademark Office which would be required under 37 C.F.R. §1.99.

This Application is now believed to be in condition for favorable reconsideration and early allowance, and such actions are respectfully requested.

Respectfully submitted,

By: Lawrence P. Kessler

Lawrence P. Kessler
Registration No. 24,637
Telephone No. (585) 253-0123
Facsimile No. (585) 726-0894

LPK:dn
Attachment(s)

NexPress Solutions LLC
1447 St. Paul Street
Rochester, NY 14653-7103

Application No. 09/628,397
Amendment Dated: March 24, 2004
Reply to Office Action Dated: January 15, 2004
Replacement Sheet

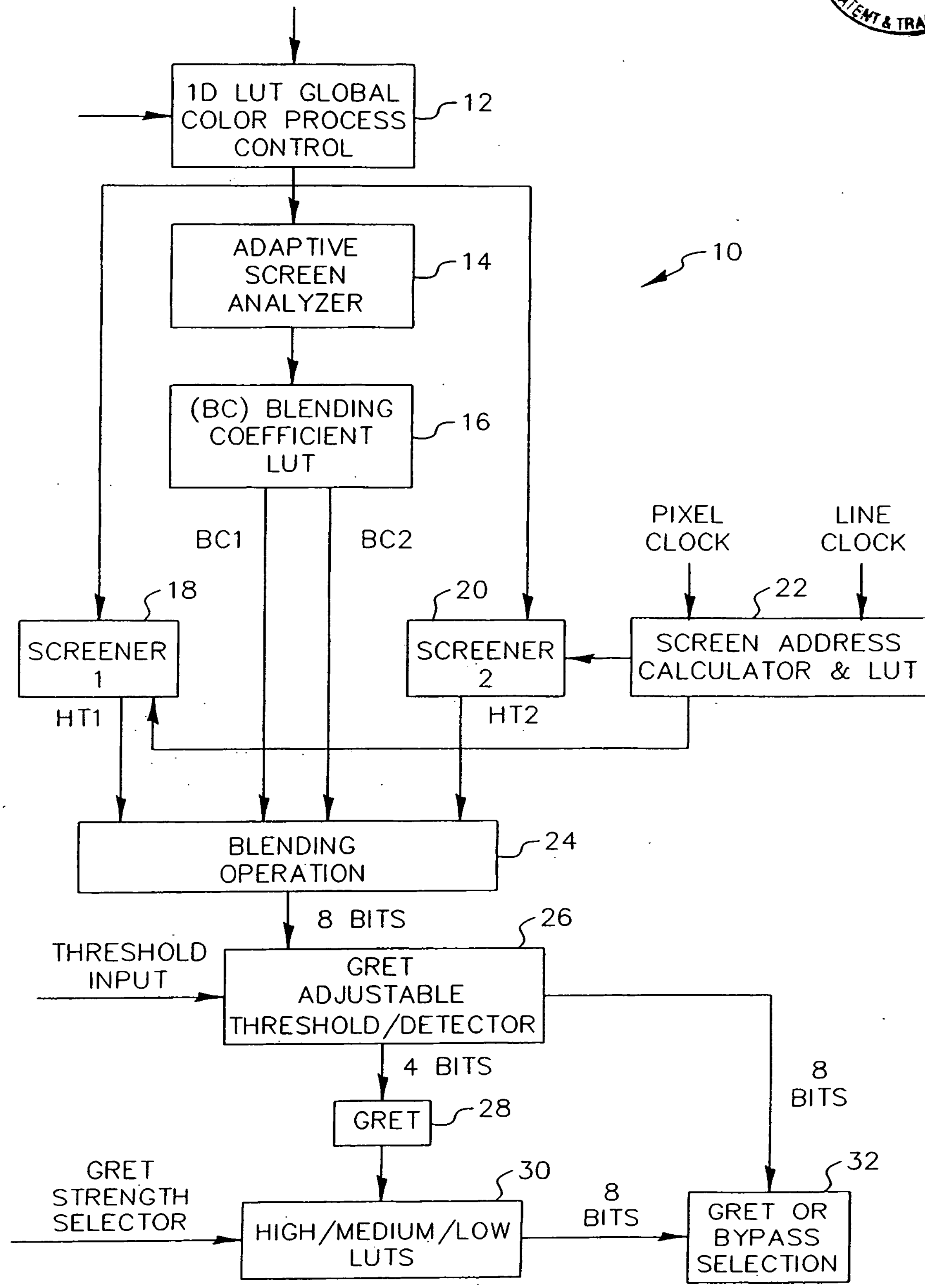


FIG. 1

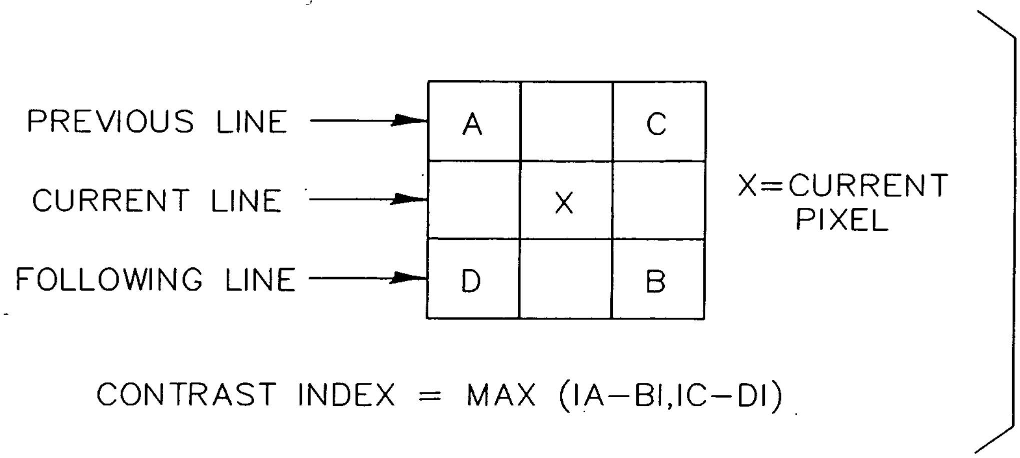

PREVIOUS LINE
CURRENT LINE
FOLLOWING LINE
A
C
X
D
B
X=CURRENT PIXEL
CONTRAST INDEX = MAX (IA-BI,IC-DI)

FIG. 2

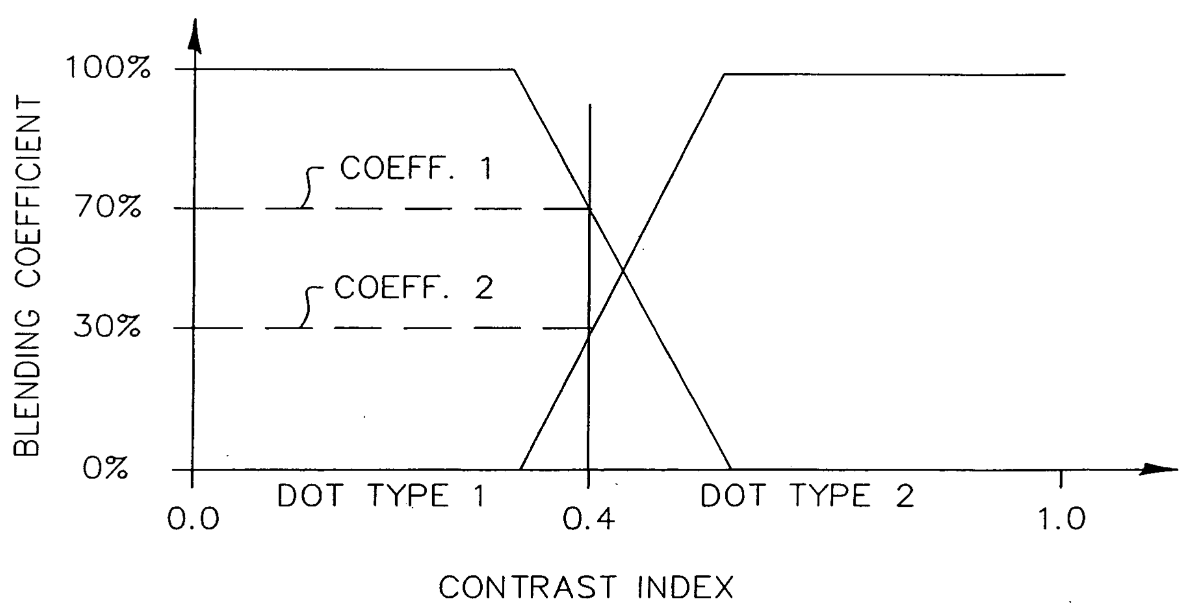

100%
70%
30%
0%
BLENDING COEFFICIENT
COEFF. 1
COEFF. 2
DOT TYPE 1
DOT TYPE 2
0.0
0.4
1.0
CONTRAST INDEX

FIG. 3

Application No. 09/628,397
Amendment Dated: March 24, 2004
Reply to Office Action Dated: January 15, 2004
Replacement Sheet

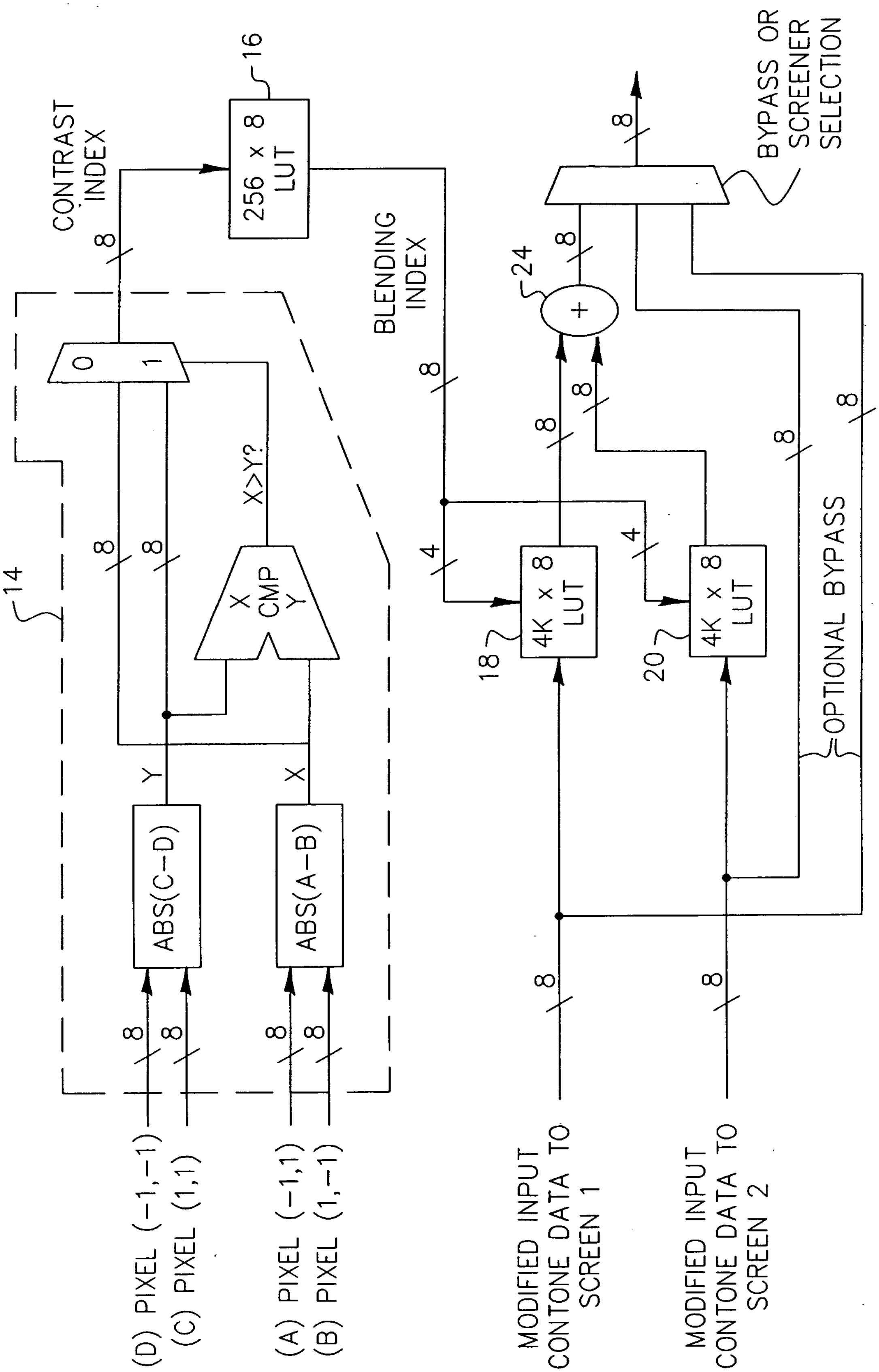


FIG. 4

Application No. 09/628,397
Amendment Dated: March 24, 2004
Reply to Office Action Dated: January 15, 2004
Replacement Sheet

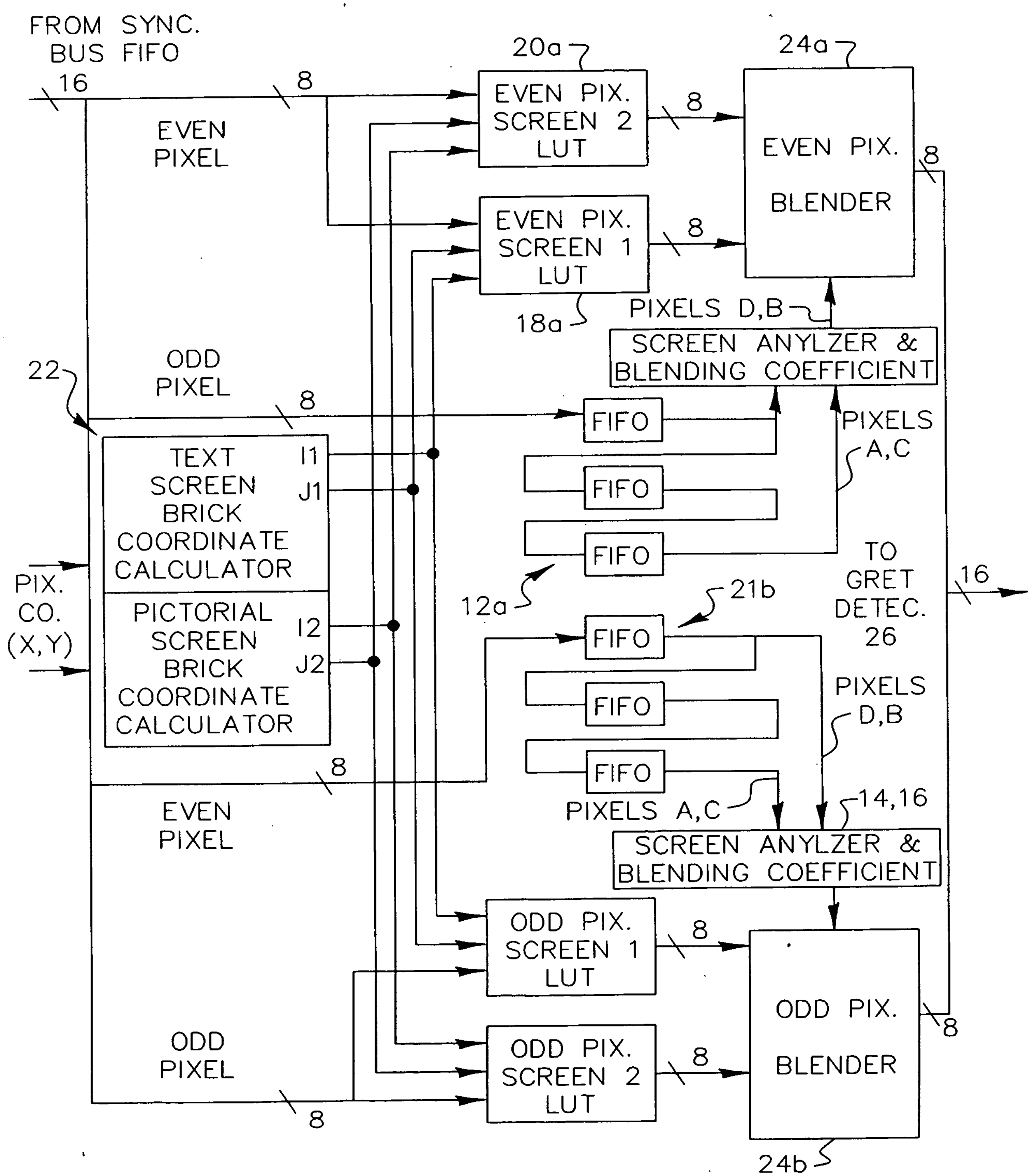


FIG. 5

Application No. 09/628,397
Amendment Dated: March 24, 2004
Reply to Office Action Dated: January 15, 2004
Replacement Sheet

PLANE=255

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	255	255	255	255	0	0	0
2	0	0	0	0	0	0	0	0	255	255	255	255	255	255	255	255	0	0	0
3	0	0	0	0	255	255	255	255	255	255	255	255	255	255	255	255	0	0	0
4	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	0	0
5	0	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	0	0
6	0	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	0	0
7	0	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	0	0
8	0	0	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	0
9	0	0	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	0
10	0	0	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	0
11	0	0	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	0
12	0	0	0	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255
13	0	0	0	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255
14	0	0	0	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255
15	0	0	0	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255
16	0	0	0	0	255	255	255	255	255	255	255	255	255	255	255	255	0	0	0
17	0	0	0	0	255	255	255	255	255	255	255	255	0	0	0	0	0	0	0
18	0	0	0	0	255	255	255	255	0	0	0	0	0	0	0	0	0	0	0

FIG. 6a

PLANE=128

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	9	166	117	32	0	0	0
2	0	0	0	0	0	0	0	0	0	120	155	40	77	233	248	187	0	0	0
3	0	0	0	0	0	70	182	57	48	204	253	209	156	219	241	83	0	0	0
4	0	32	187	83	32	163	253	228	155	202	248	132	0	54	168	32	0	0	0
5	0	117	248	241	168	182	243	181	22	27	152	70	0	13	182	163	70	0	0
6	0	166	233	219	54	13	117	116	0	0	134	194	81	117	243	253	182	0	0
7	0	0	86	156	0	0	81	212	104	86	225	255	212	116	181	228	57	0	0
8	0	0	40	209	132	70	194	255	235	126	157	235	104	0	22	155	48	0	0
9	0	0	155	253	248	152	134	225	164	0	0	133	86	0	27	202	204	120	0
10	0	0	120	204	202	27	0	86	133	0	0	164	225	134	152	248	253	155	0
11	0	0	0	48	155	22	0	104	235	157	126	235	255	194	70	132	209	40	0
12	0	0	0	57	228	181	116	212	255	225	86	104	212	81	0	0	156	86	0
13	0	0	0	182	253	243	117	81	194	134	0	0	116	117	13	54	219	233	166
14	0	0	0	70	163	182	13	0	70	152	27	22	181	243	182	168	241	248	117
15	0	0	0	0	32	168	54	0	132	248	202	155	228	253	163	32	83	187	32
16	0	0	0	0	83	241	219	156	209	253	204	48	57	182	70	0	0	0	0
17	0	0	0	0	187	248	233	86	40	155	120	0	0	0	0	0	0	0	0
18	0	0	0	0	32	117	166	0	0	0	0	0	0	0	0	0	0	0	0

FIG. 6b

PLANE=2

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	12	34	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	47	0	0	11	30	0	0	0	0
4	0	0	0	0	0	0	36	11	0	0	42	0	0	0	0	0	0	0	0
5	0	0	24	23	0	0	32	10	0	0	0	0	0	0	0	0	0	0	0
6	0	0	22	20	0	0	0	0	0	0	0	0	0	0	18	51	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	68	0	0	5	14	0	0	0
8	0	0	0	0	0	0	0	52	16	0	0	19	0	0	0	0	0	0	0
9	0	0	0	35	33	0	0	15	4	0	0	0	0	0	0	0	0	0	0
10	0	0	0	10	9	0	0	0	0	0	0	0	0	0	0	24	64	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	88	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	67	21	0	0	0	0	0	0	0	0	0
13	0	0	0	0	45	42	0	0	0	0	0	0	0	0	0	0	6	18	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	24	0	0	17	46	0
15	0	0	0	0	0	0	0	0	0	19	6	0	0	63	0	0	0	0	0
16	0	0	0	0	0	12	12	0	0	49	15	0	0	0	0	0	0	0	0
17	0	0	0	0	0	33	31	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

FIG. 6c

PLANE=255

255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255
255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255
255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255
255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255
255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255
255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255
255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255
255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255
255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255		

FIG. 7a

PLANE=128

0	0	0	0	0	0	81	20	0	1	35	0	0	0	0	0	0	0	1	1	0	0	101	24	0	0	3
0	0	0	0	0	0	0	17	16	0	0	82	21	0	0	0	0	0	0	0	0	0	0	35	32	0	0
53	16	0	0	0	0	0	0	0	0	0	0	52	48	0	0	24	5	0	0	0	0	0	0	0	1	0
0	68	57	0	0	2	1	0	0	0	0	0	0	6	21	0	0	54	50	0	0	0	0	0	0	0	0
0	0	18	49	0	0	36	34	0	0	0	0	0	0	0	0	0	0	24	70	0	0	18	17	0	0	0
0	0	0	0	2	0	0	35	96	0	0	2	2	0	0	0	0	0	0	1	32	0	0	25	73	0	0
0	0	0	0	0	0	0	0	1	65	0	0	18	51	0	0	0	0	0	0	0	0	0	0	2	98	0
0	6	23	0	0	0	0	0	0	0	1	0	0	3	128	0	0	1	2	0	0	0	0	0	0	0	22
4	0	2	101	0	0	0	0	0	0	0	0	0	0	0	51	9	0	1	68	0	0	0	0	0		

FIG. 7b

PLANE=2

0	0	0	0	0	0	51	14	0	1	23	0	0	0	0	0	0	0	1	1	0	0	65	18	0	0	3
0	0	0	0	0	0	0	11	10	0	0	52	15	0	0	0	0	0	0	0	0	0	0	23	20	0	0
35	10	0	0	0	0	0	0	0	0	0	0	34	30	0	0	18	5	0	0	0	0	0	0	0	1	0
0	44	39	0	0	2	1	0	0	0	0	0	0	6	15	0	0	36	32	0	0	0	0	0	0	0	0
0	0	12	31	0	0	24	22	0	0	0	0	0	0	0	0	0	0	18	46	0	0	12	11	0	0	0
0	0	0	0	2	0	0	23	60	0	0	2	2	0	0	0	0	0	0	1	20	0	0	19	49	0	0
0	0	0	0	0	0	0	0	1	41	0	0	12	33	0	0	0	0	0	0	0	0	0	0	2	62	0
0	6	17	0	0	0	0	0	0	0	1	0	0	3	80	0	0	1	2	0	0	0	0	0	0	0	16
4	0	2	65	0	0	0	0	0	0	0	0	0	0	0	33	9	0	1	44	0	0	0	0	0		

FIG. 7c

Application No. 09/628,397
Amendment Dated: March 24, 2004
Reply to Office Action Dated: January 15, 2004
Replacement Sheet

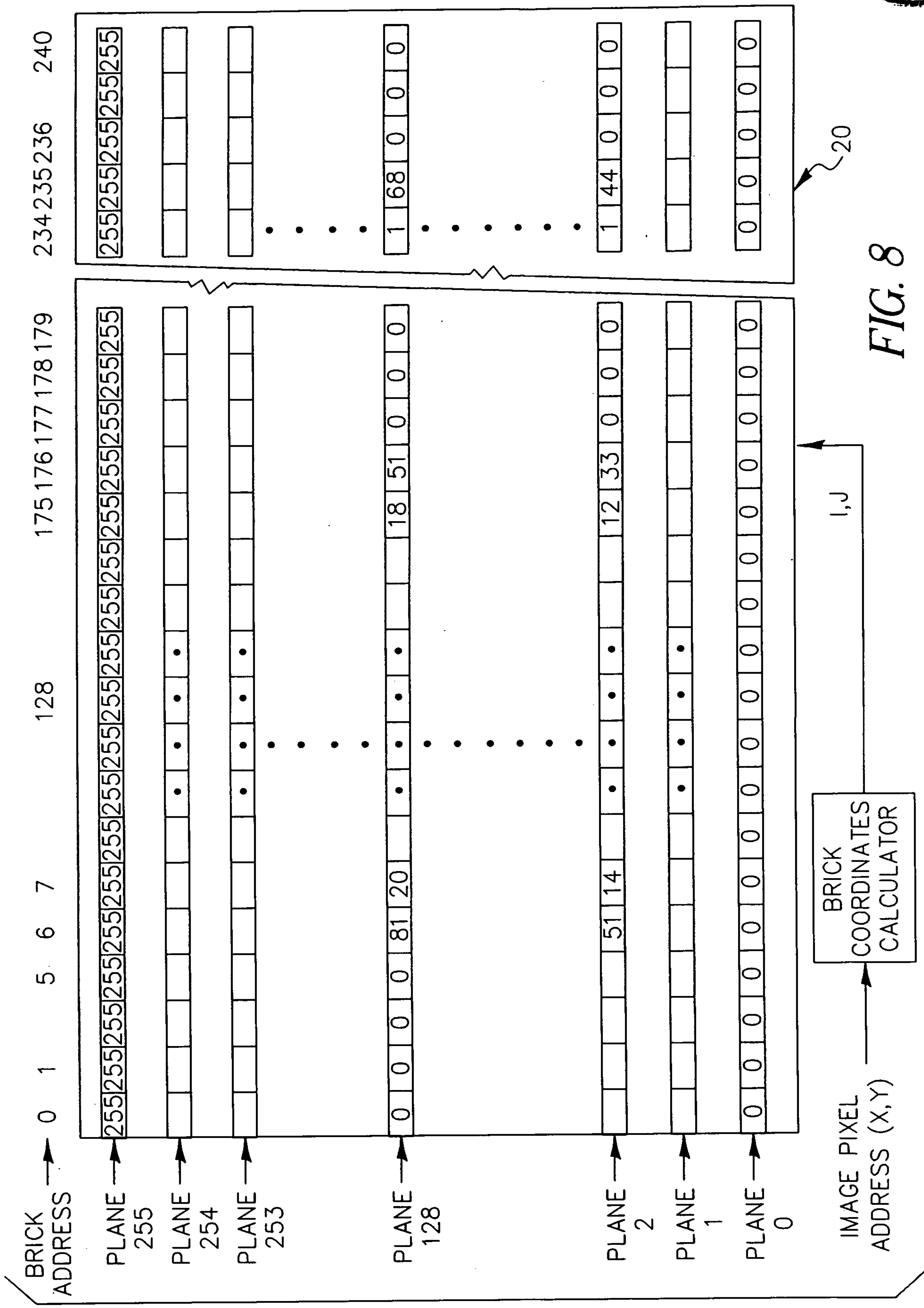


FIG. 8

Application No. 09/628,397
Amendment Dated: March 24, 2004
Reply to Office Action Dated: January 15, 2004
Replacement Sheet

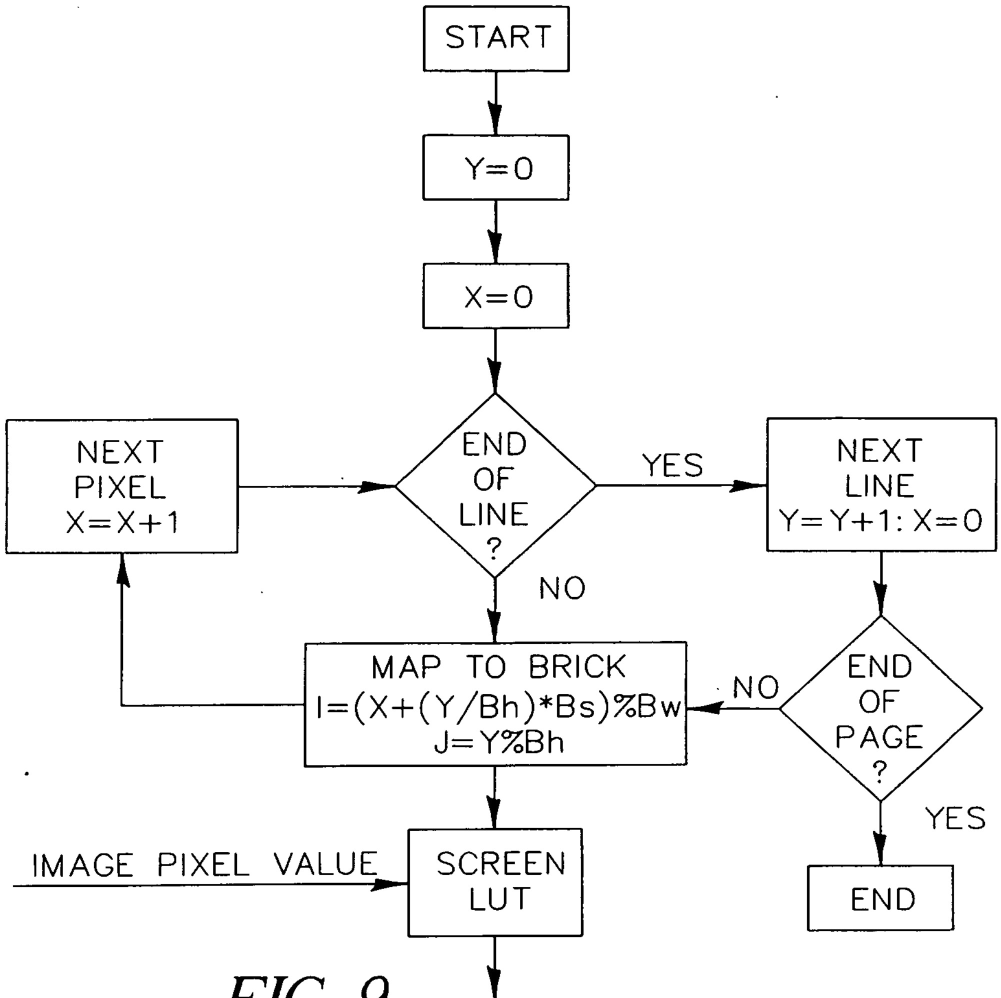


FIG. 9

PLANE 255

255	255
255	255

PLANE 128

127	128
128	128

PLANE 2

1	2
2	2

FIG. 10

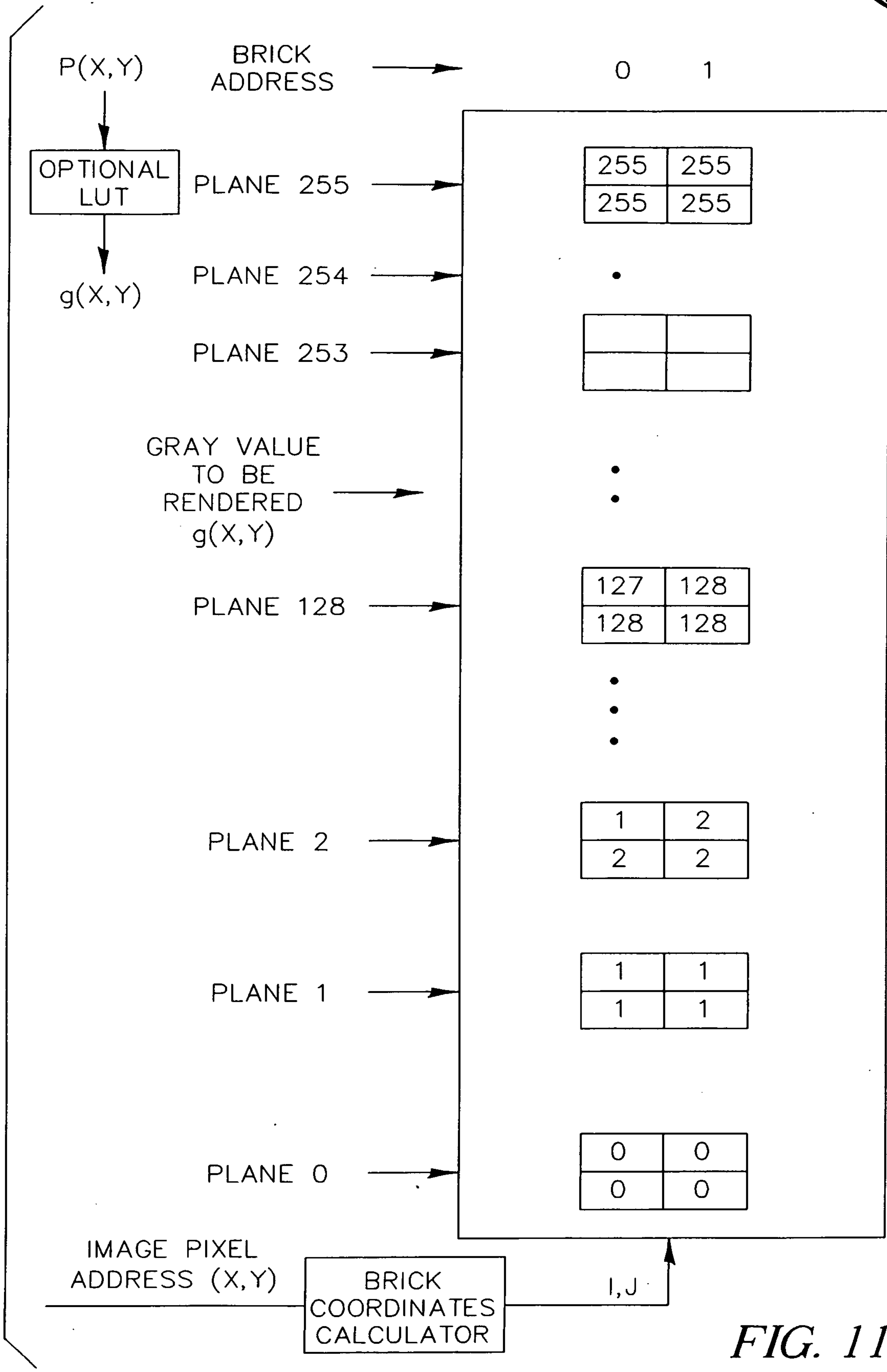

P(X,Y)
OPTIONAL LUT
g(X,Y)
BRICK ADDRESS
0
1
PLANE 255
255
255
255
255
PLANE 254
PLANE 253
GRAY VALUE TO BE RENDERED g(X,Y)
PLANE 128
127
128
128
128
PLANE 2
1
2
2
2
PLANE 1
1
1
1
1
PLANE 0
0
0
0
0
IMAGE PIXEL ADDRESS (X,Y)
BRICK COORDINATES CALCULATOR
I,J

FIG. 11

Application No. 09/628,397
Amendment Dated: March 24, 2004
Reply to Office Action Dated: January 15, 2004
Replacement Sheet

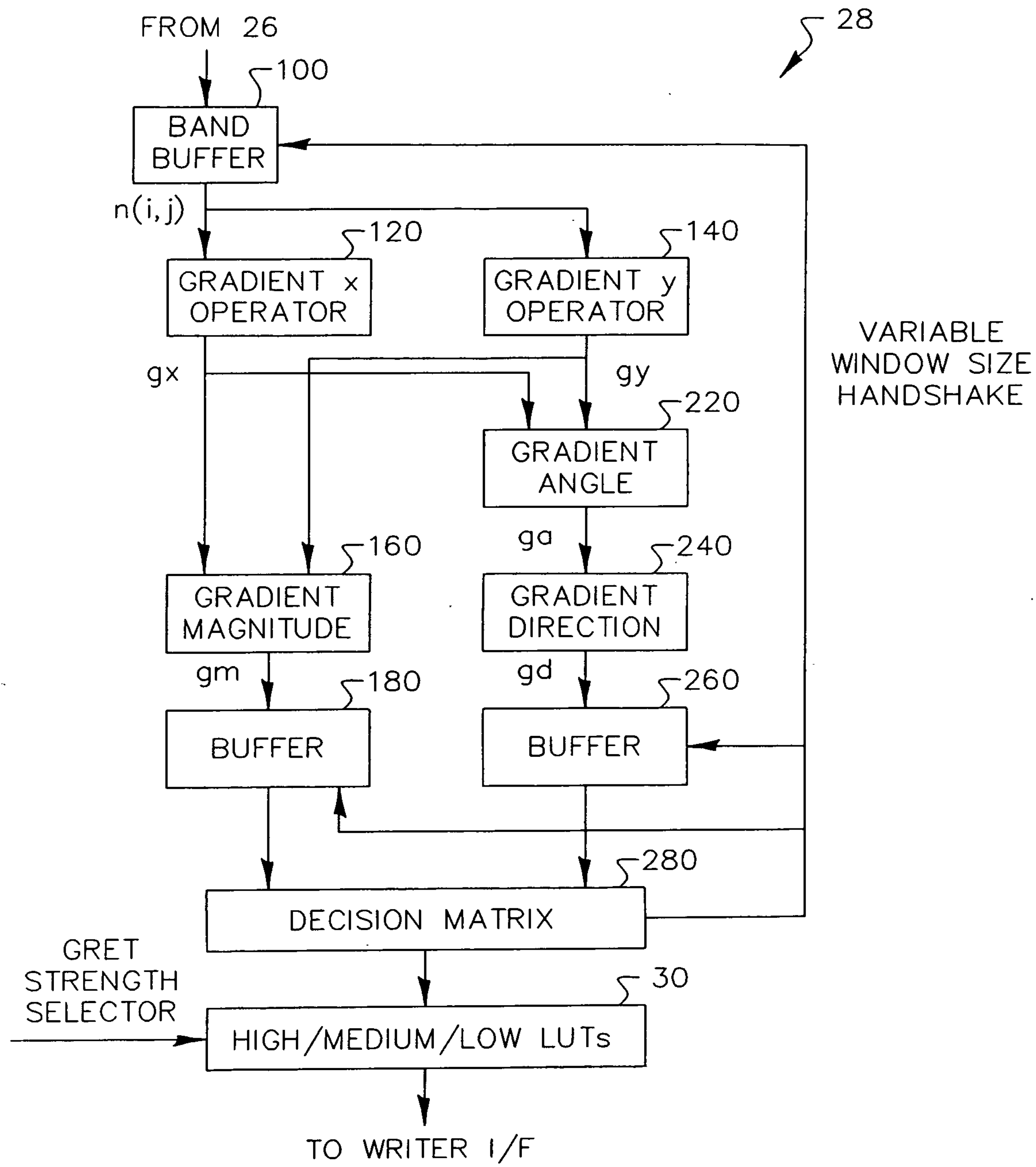


FIG. 12

Application No. 09/628,397
Amendment Dated: March 24, 2004
Reply to Office Action Dated: January 15, 2004
Replacement Sheet

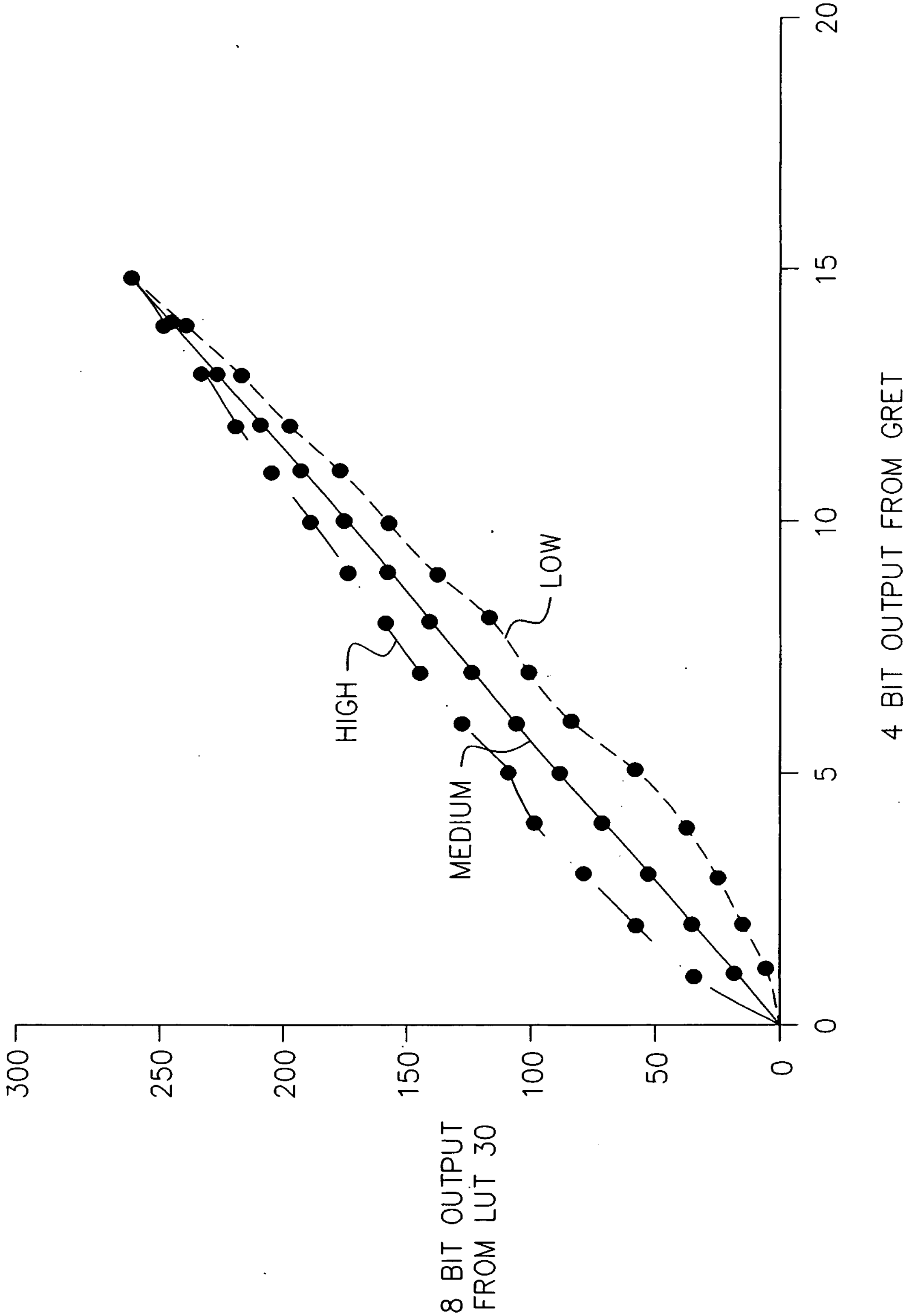


FIG. 13

Application No. 09/628,397
Amendment Dated: March 24, 2004
Reply to Office Action Dated: January 15, 2004
Replacement Sheet

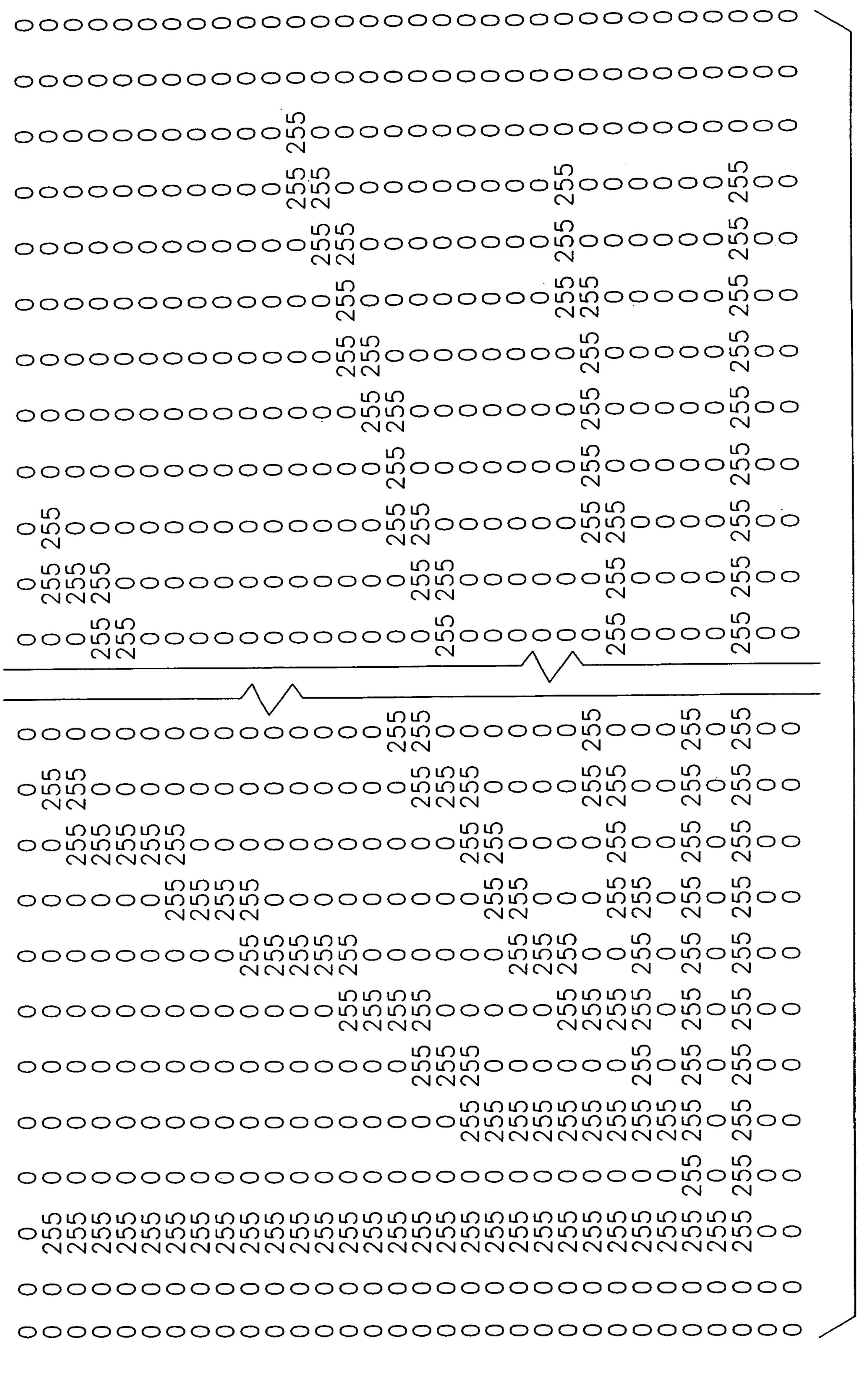


FIG. 14

Application No. 09/628,397
Amendment Dated: March 24, 2004
Reply to Office Action Dated: January 15, 2004
Replacement Sheet

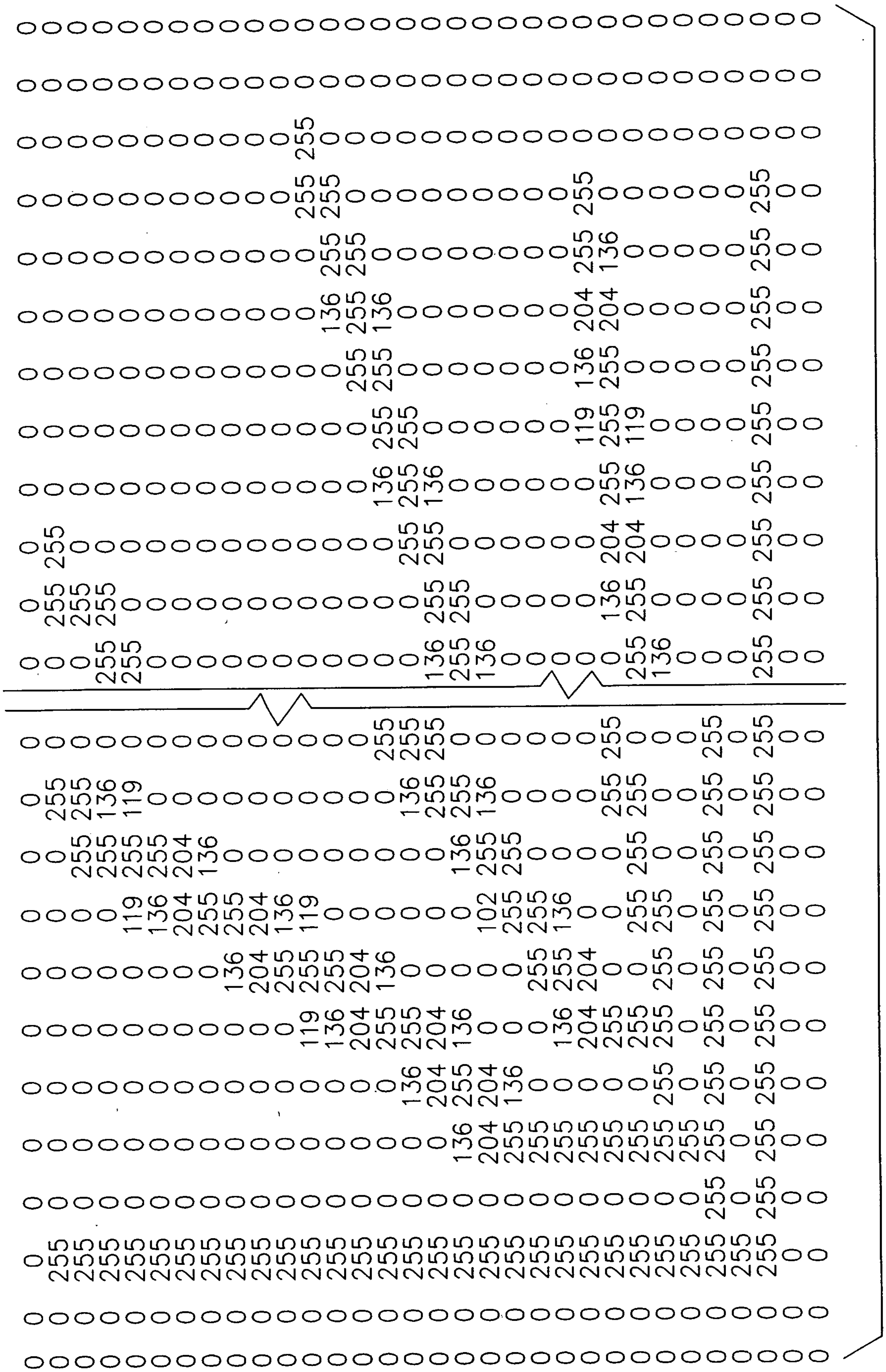


FIG. 15

Application No. 09/628,397
Amendment Dated: March 24, 2004
Reply to Office Action Dated: January 15, 2004
Replacement Sheet

0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	255	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	255	255	0	0	0	0	0	0	0	0	0	255	0	0	0	0	0	0	255	0	0
0	0	0	0	0	0	0	0	0	0	0	0	255	255	0	0	0	0	0	0	0	0	255	116	0	0	0	0	0	255	0	0
0	0	0	0	0	0	0	0	0	0	0	0	116	255	116	0	0	0	0	0	0	0	193	193	0	0	0	0	0	255	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	255	255	0	0	0	0	0	0	0	116	255	0	0	0	0	0	255	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	255	255	0	0	0	0	0	0	98	255	98	0	0	0	0	255	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	116	255	116	0	0	0	0	0	0	255	116	0	0	0	0	255	0	0
0	255	0	0	0	0	0	0	0	0	0	0	0	0	0	255	255	0	0	0	0	0	0	193	193	0	0	0	0	255	0	0
0	255	255	255	0	0	0	0	0	0	0	0	0	0	0	0	255	255	0	0	0	0	0	116	255	0	0	0	0	255	0	0
0	0	0	255	255	0	0	0	0	0	0	0	0	0	0	0	116	255	116	0	0	0	0	0	255	116	0	0	0	255	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	116	255	255	116	0	0	0	0	116	255	116	0	116	255	0	255	0	0
0	255	255	116	98	0	0	0	0	0	0	0	0	0	0	0	255	255	255	0	0	0	0	193	193	0	0	255	0	255	0	0
0	0	255	255	255	255	193	116	0	0	0	0	0	0	0	0	0	116	255	255	0	0	0	116	255	116	0	255	0	255	0	0
0	0	0	0	98	116	193	255	255	193	116	98	0	0	0	0	0	0	81	255	255	116	0	0	255	255	0	255	0	255	0	0
0	0	0	0	0	0	0	0	116	193	255	255	255	193	116	0	0	0	0	0	255	255	193	0	0	255	0	255	0	255	0	0
0	0	0	0	0	0	0	0	0	0	0	98	116	193	255	255	193	116	0	0	0	116	193	255	255	255	0	255	0	255	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	116	193	255	193	116	0	0	0	0	0	255	0	255	0	255	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	116	193	255	255	255	255	255	255	255	255	255	0	255	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	255	0	255	0	0
0	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

FIG. 16

Application No. 09/628,397
Amendment Dated: March 24, 2004
Reply to Office Action Dated: January 15, 2004
Replacement Sheet

0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	255	0	0	0	0	0	0	0	255	0	0	255	255	0	0	0	0	0	0	0	0	0
0	0	255	0	0	0	0	0	0	255	255	0	0	255	0	0	0	0	0	0	0	0	0	0
0	0	255	0	0	0	0	0	0	255	154	0	255	255	0	0	0	0	0	0	0	0	0	0
0	0	255	0	0	0	0	0	139	255	139	0	255	0	0	0	0	0	0	0	0	0	0	0
0	0	255	0	0	0	0	0	154	255	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	255	0	0	0	0	0	213	213	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	255	0	0	0	0	0	255	154	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	255	0	0	0	0	154	255	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	255	0	0	0	0	213	213	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	255	0	0	0	0	255	154	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	255	0	0	0	139	255	139	0	0	0	0	0	0	0	0	0	0	0	255	255	0	0
0	0	255	0	0	0	154	255	0	0	0	0	0	0	0	0	0	0	154	255	255	0	0	0
0	0	255	0	0	0	213	213	0	0	0	0	0	0	0	0	0	255	255	255	0	0	0	0
0	0	255	0	0	0	255	154	0	0	0	154	0	0	0	154	255	255	154	0	0	0	0	0
0	0	255	0	0	154	255	0	0	0	0	255	0	0	255	255	255	0	0	0	0	0	0	0
0	0	255	0	0	213	213	0	0	0	255	255	154	255	255	154	0	0	0	0	0	0	0	0
0	0	255	0	154	255	154	0	0	154	255	154	255	255	0	0	0	0	0	0	0	0	0	0
0	0	255	0	213	213	0	0	123	255	255	0	154	0	0	0	0	0	0	0	0	0	0	0
0	0	255	0	255	154	0	0	255	255	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	255	0	255	0	0	255	255	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	255	0	255	0	154	255	154	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	255	0	255	0	213	213	0	0	0	154	0	0	0	0	139	154	213	255	255	0	0	0
0	0	255	0	255	0	255	0	0	154	213	255	0	154	213	255	255	255	213	154	0	0	0	0
0	0	255	0	255	0	255	0	255	255	213	154	255	255	213	154	139	0	0	0	0	0	0	0
0	0	255	0	255	255	255	255	255	154	0	0	154	0	0	0	0	0	0	0	0	0	0	0
0	0	255	0	255	0	0	0	0	0	0	154	0	0	0	0	0	0	0	0	0	0	0	0
0	0	255	255	255	255	255	255	255	255	255	255	0	0	0	0	0	0	0	0	0	0	0	0
0	0	255	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

FIG. 17

Application No. 09/628,397
Amendment Dated: March 24, 2004
Reply to Office Action Dated: January 15, 2004
Replacement Sheet

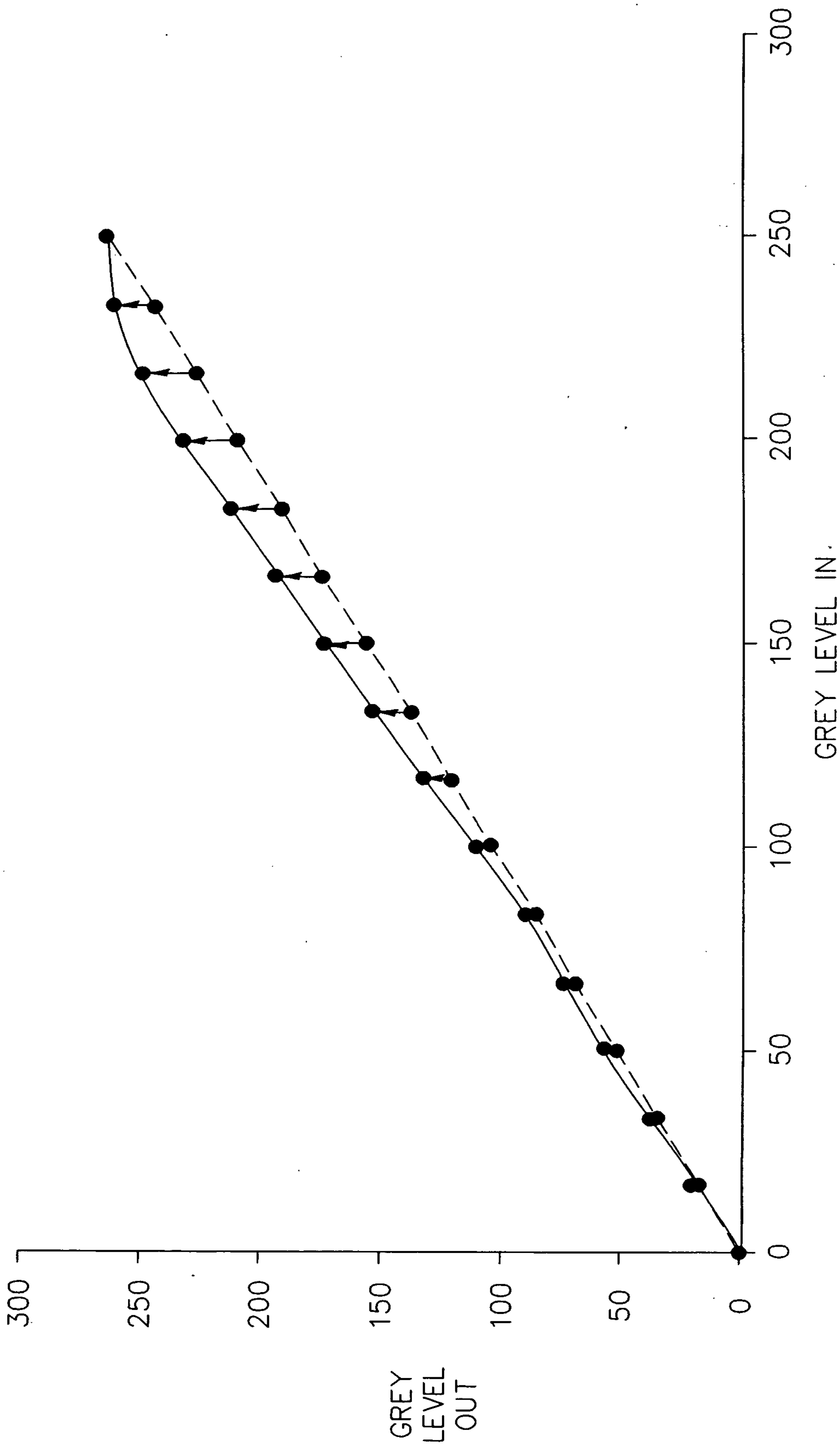


FIG. 18

Application No. 09/628,397
Amendment Dated: March 24, 2004
Reply to Office Action Dated: January 15, 2004
Replacement Sheet

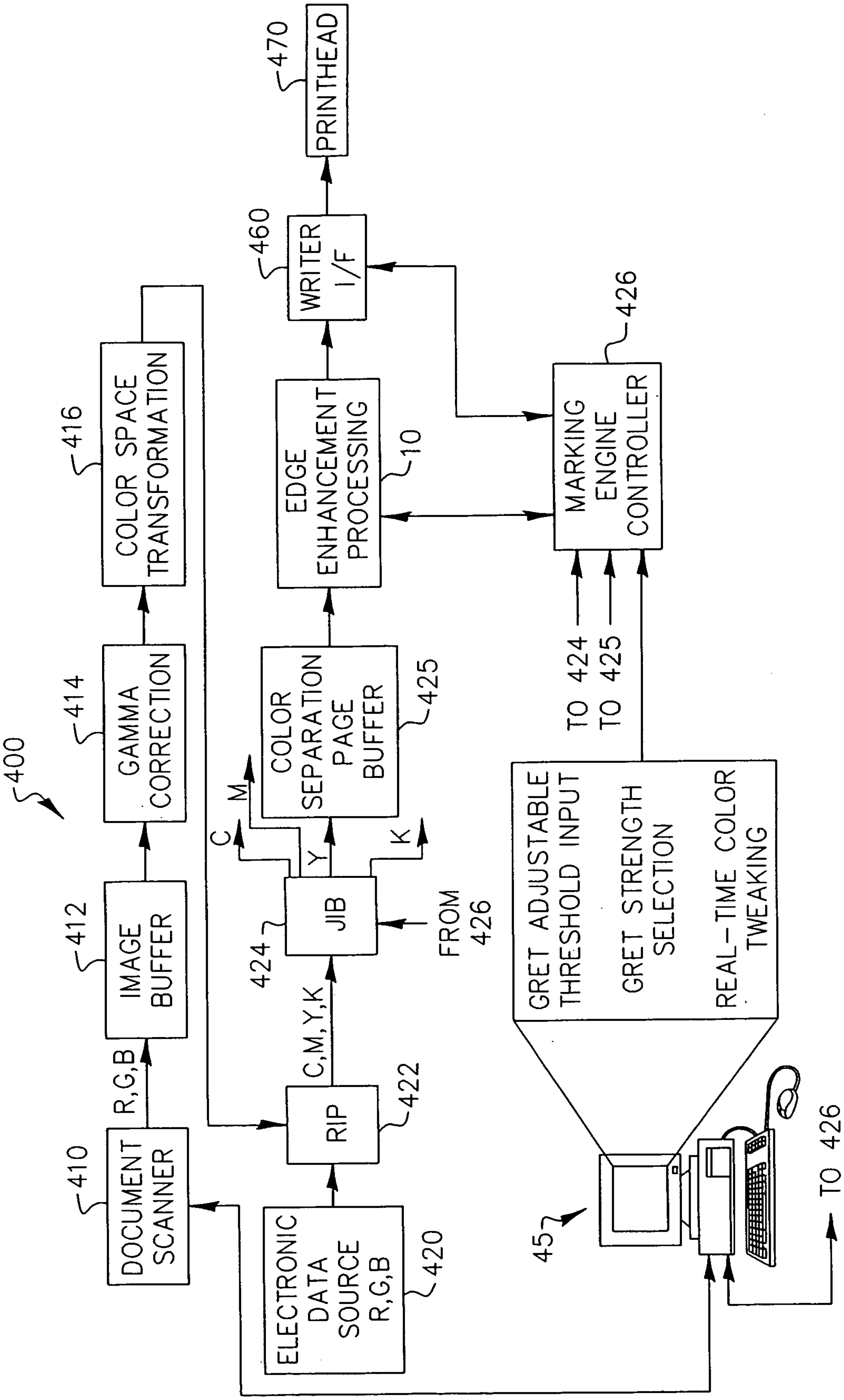
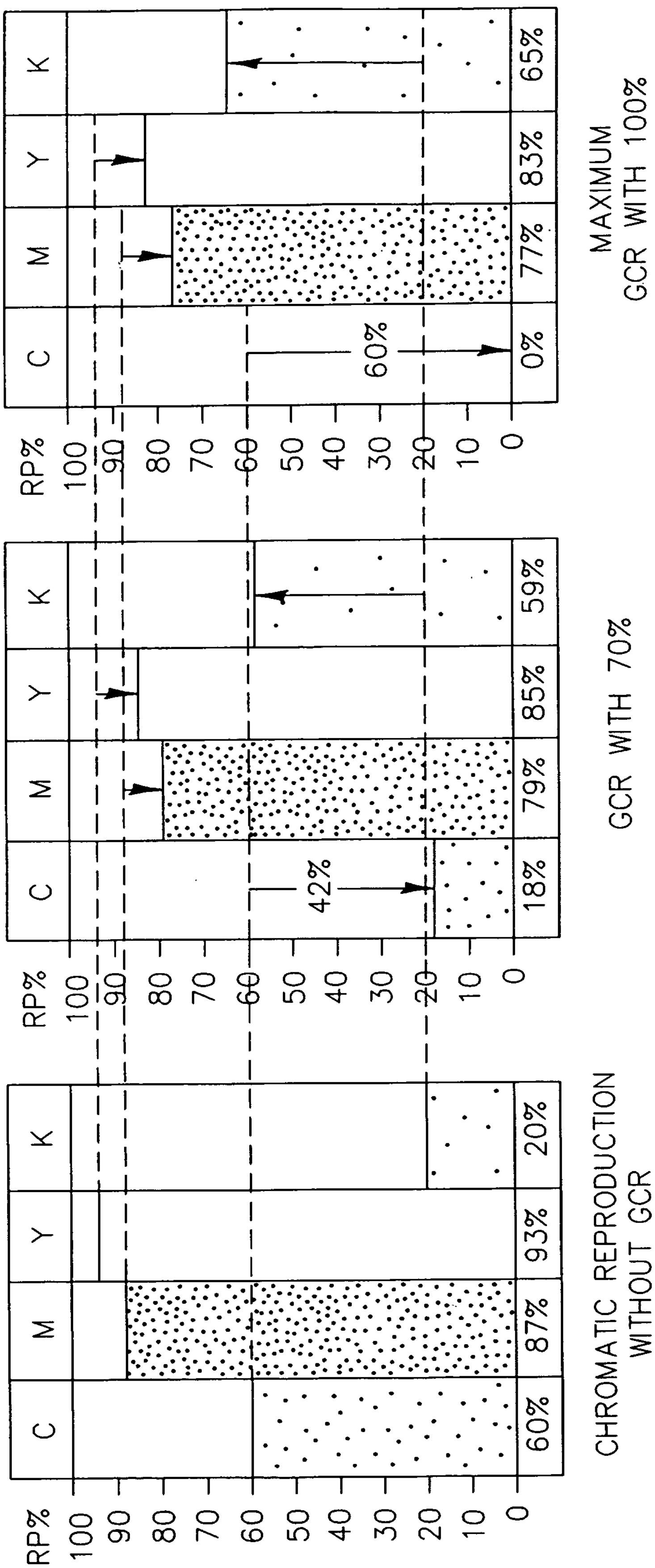


FIG. 19

Application No. 09/628,397
Amendment Dated: March 24, 2004
Reply to Office Action Dated: January 15, 2004
Replacement Sheet



DOMINANT COLORS: Y,M=RED
COMPLEMENTARY COLOR=CYAN

FIG. 20a

Application No. 09/628,397
Amendment Dated: March 24, 2004
Reply to Office Action Dated: January 15, 2004
Replacement Sheet

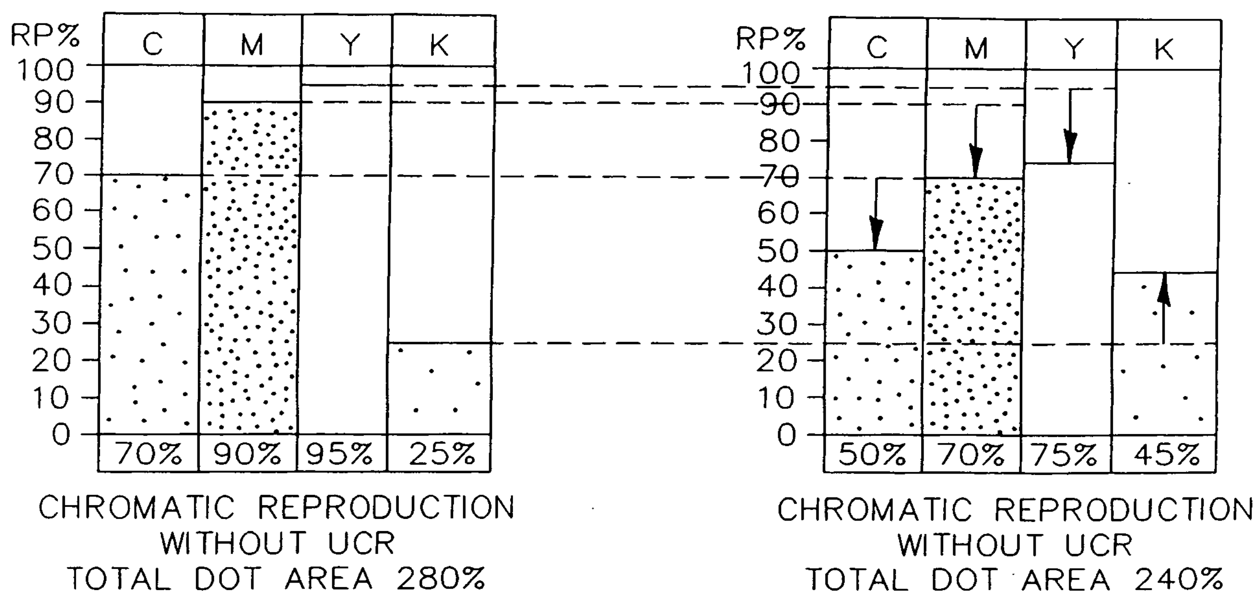


FIG. 20b

STEP 1

TILE STRUCTURE

X	X	X	X	X	X	X
X	X	X	C1	X	X	X
X	X	C1	C1	C1	X	X
X	C1	C1	C1	C1	C1	X
X	C1	C1	C1	C1	C1	X
X	X	C1	C1	C1	X	X
X	X	X	C1	X	X	X
X	X	X	X	X	X	X

FIG. 21-1

STEP 2

LABEL PIXEL SEQUENCE
IN THE TILE

0	0	0	0	0	0	0
0	0	0	1	0	0	0
0	0	2	3	4	0	0
0	5	6	7	8	9	0
0	10	11	12	13	14	0
0	0	15	16	17	0	0
0	0	0	18	0	0	0
0	0	0	0	0	0	0

FIG. 21-2

Application No. 09/628,397
Amendment Dated: March 24, 2004
Reply to Office Action Dated: January 15, 2004
Replacement Sheet

STEP 3

FILL UP IMAGE PLANE WITH TILE

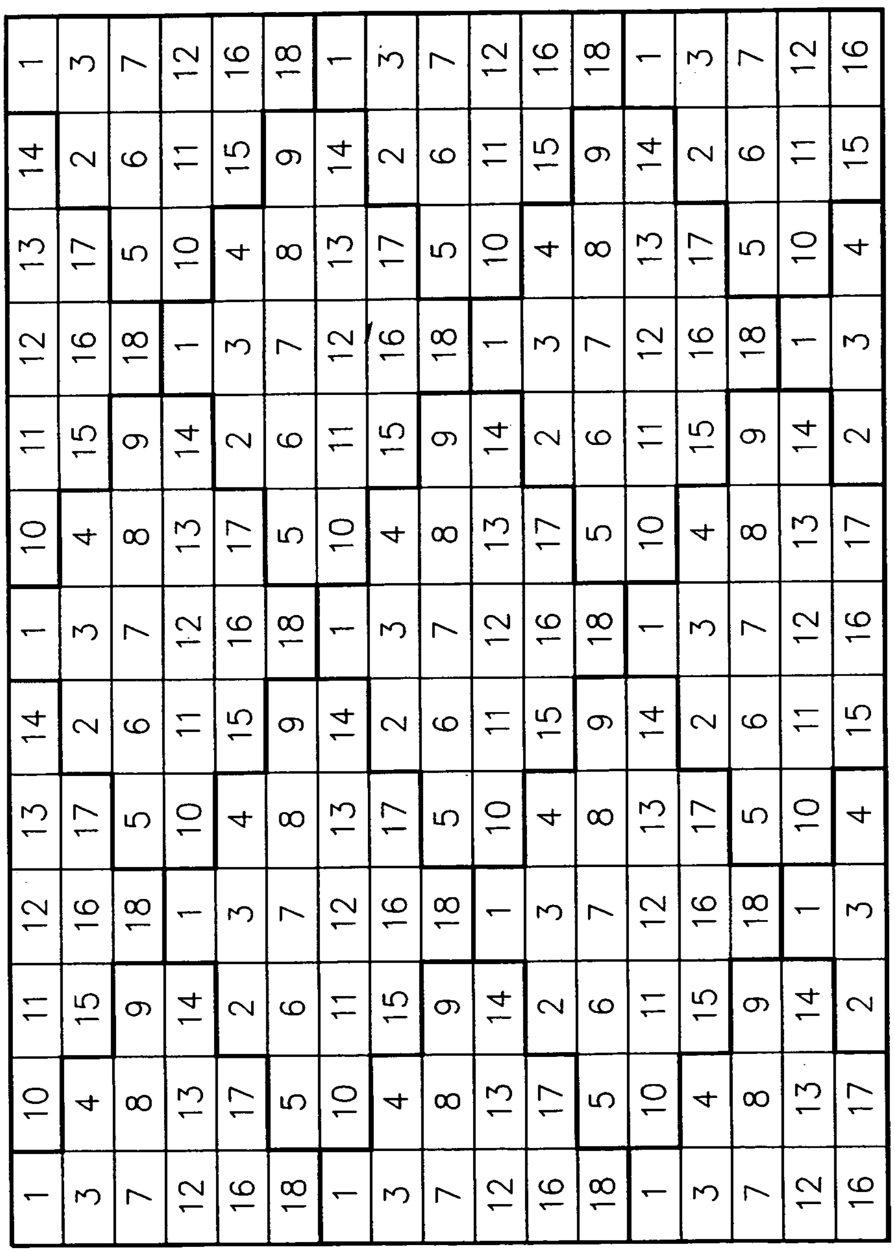


FIG. 21-3

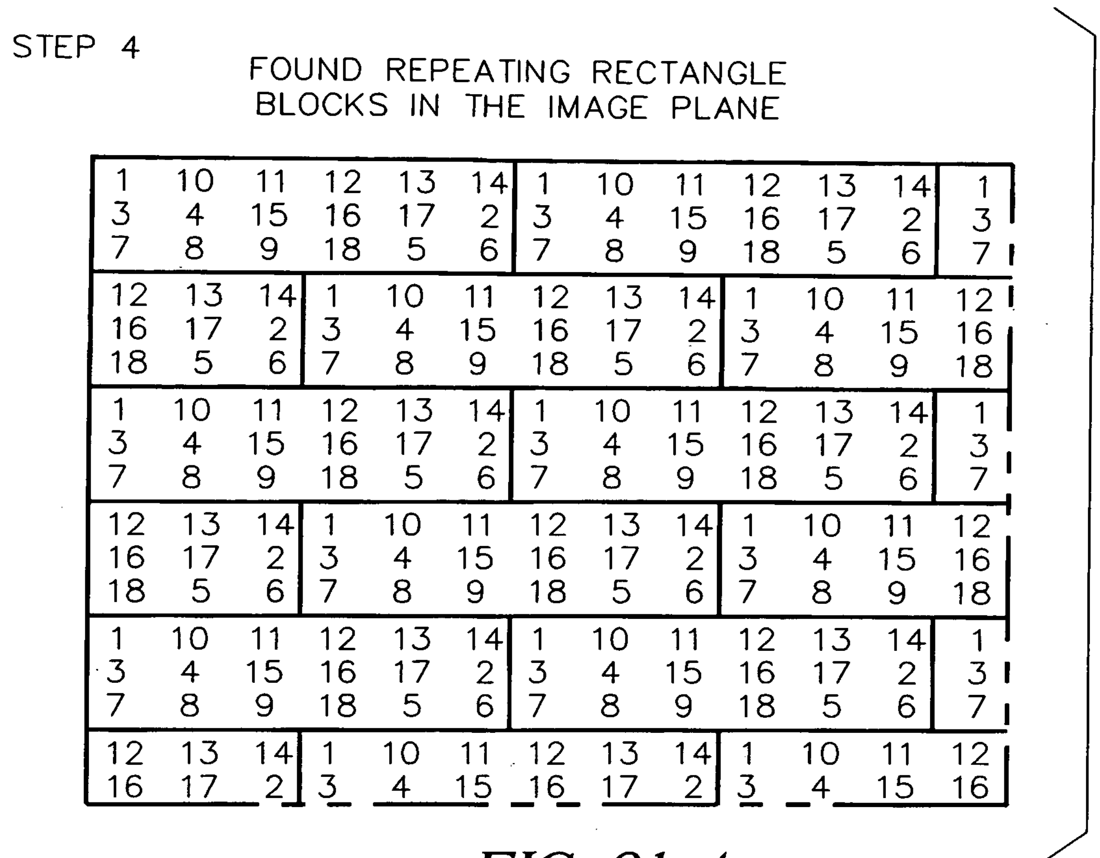


FIG. 21-4

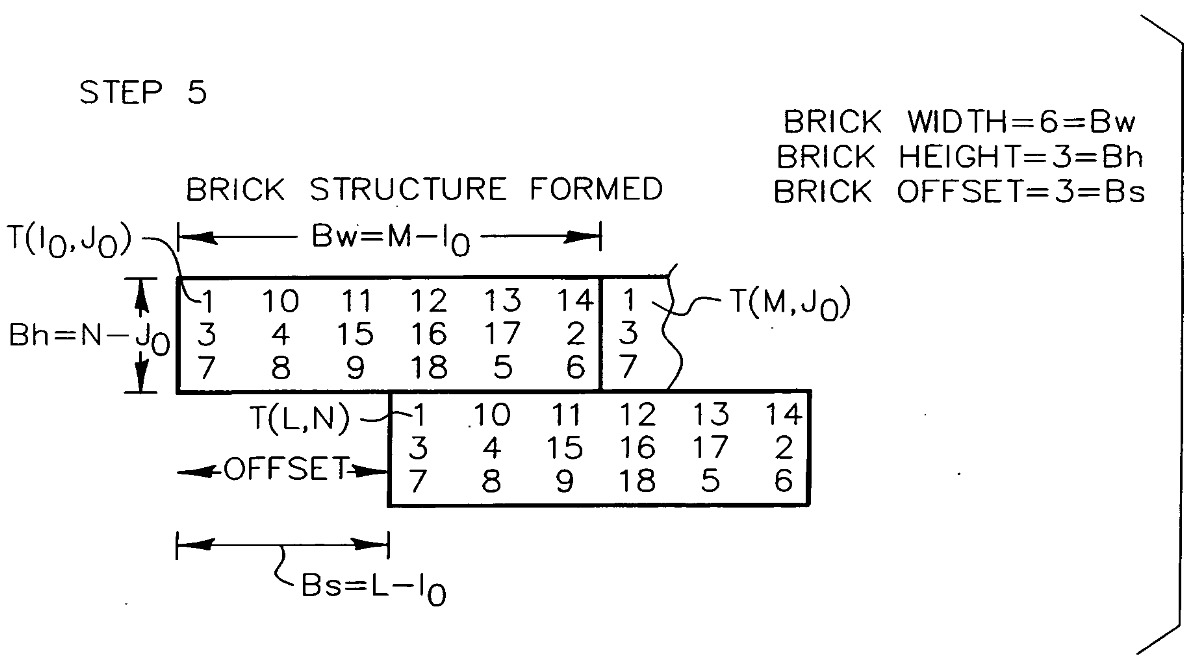


FIG. 21-5

STEP 6

CONVERTS 3-D LUT TILE STRUCTURE TO 3-D LUT BRICK STRUCTURE

LEVEL 0

.
.

LEVEL 2

106	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0

.
.
.

LEVEL 128

255	231	0	0	0	231
255	231	0	0	0	231
220	99	99	220	100	100

.
.
.

LEVEL 255

255	255	255	255	255	255
255	255	255	255	255	255
255	255	255	255	255	255

FIG. 21-6

Application No. 09/628,397
Amendment Dated: March 24, 2004
Reply to Office Action Dated: January 15, 2004
Replacement Sheet

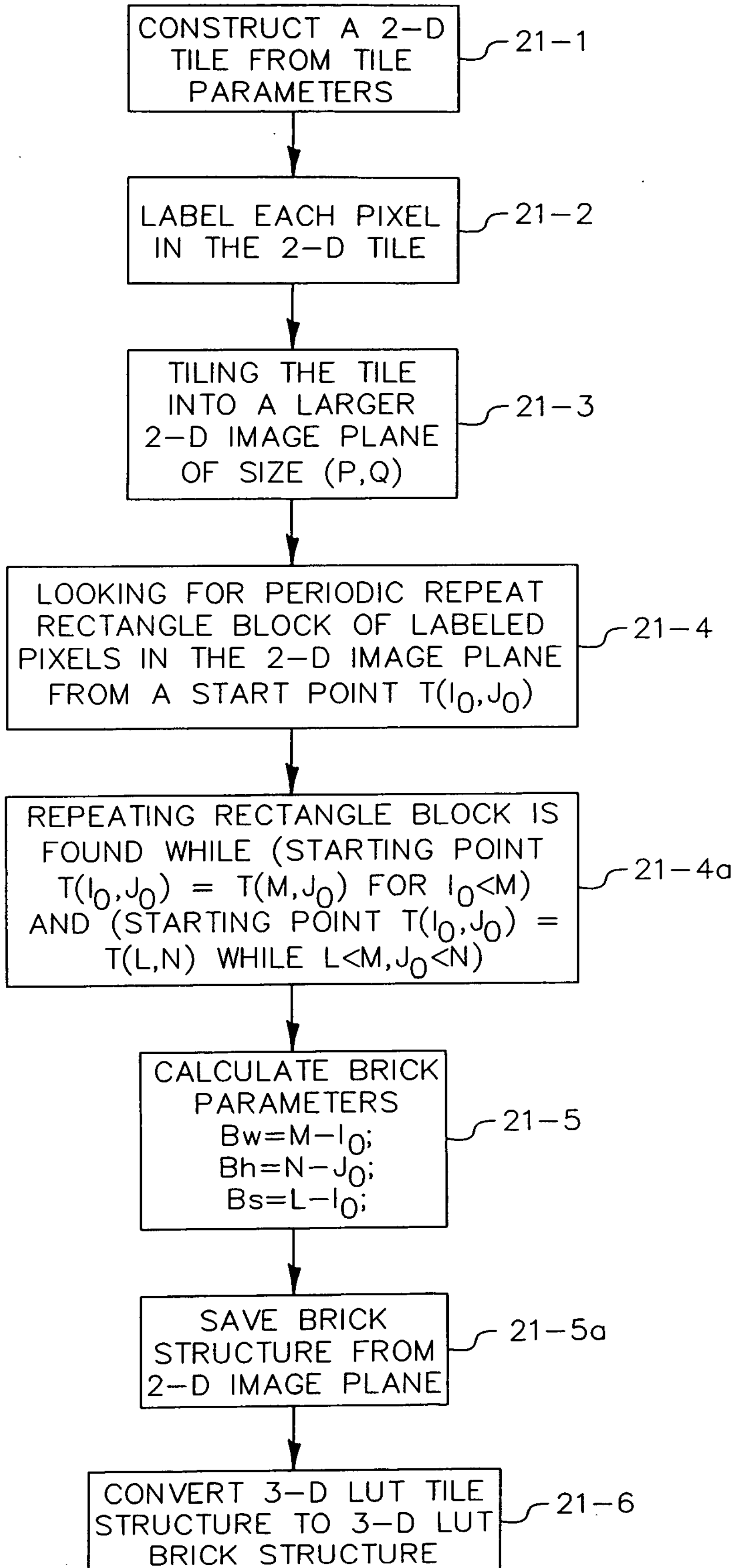


FIG. 22

GRAY LEVEL = 2

C1	C1	C1	C1	C2	C2	C2
C1	C1	C1	C1	C2	C2	C2
C1	C1	C1	C1	C2	C2	C2
C3	C3	C3	C4	C2	C2	C2
C3	C3	C3	C4	C4	C4	C4
C3	C3	C3	C4	C4	C4	C4
C3	C3	C3	C4	C4	C4	C4

S1	E1	S1	E1
S2	E2	S2	E2
S3.	E3	S3	E3
S4	E4	S4	E4
S5	E5	S5	E5
S6	E6	S6	E6
S7	E7	S7	E7
S1	E1	S1	E1
S2	E2	S2	E2
S3	E3	S3	E3
S4	E4	S4	E4
S5	E5	S5	E5
S6	E6	S6	E6
S7	E7	S7	E7

FIG. 23a

GRAY LEVEL = 2

0	0	0	0	0	0	0
0	31	18	0	7	42	0
0	15	8	0	3	20	0
0	0	0	0	0	0	0
0	8	5	0	2	11	0
0	38	21	0	8	51	0
0	0	0	0	0	0	0

BRICK STRUCTURE

0	0	0	0	0	0	0
0	31	18	0	7	42	0
0	15	8	0	3	20	0
0	0	0	0	0	0	0
0	8	5	0	2	11	0
0	38	21	0	8	51	0
0	0	0	0	0	0	0

FIG. 23b

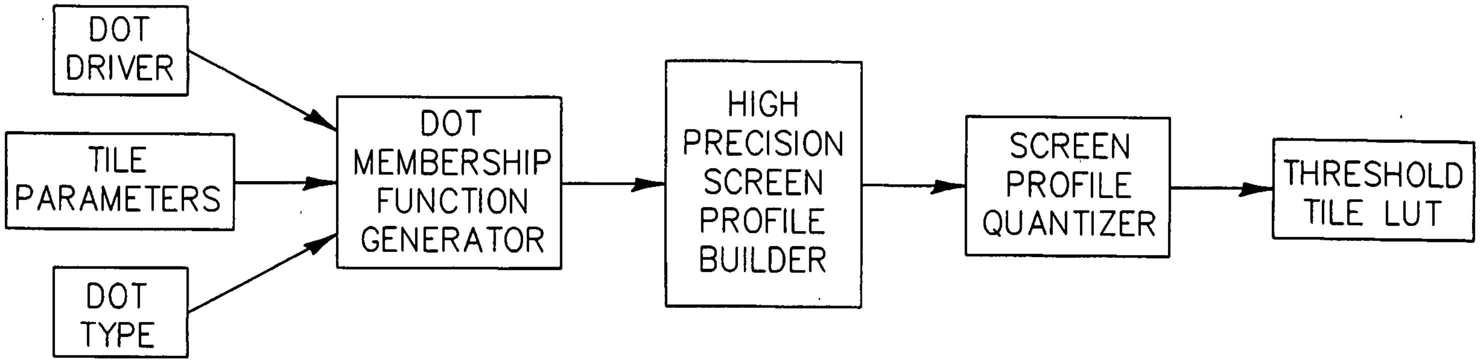
GRAY LEVEL = 128

20	164	83	5	83	164	20
164	255	229	132	223	255	164
83	229	163	51	159	233	83
5	132	51	0	51	132	5
83	223	159	51	158	224	83
164	255	233	132	224	255	164
20	164	83	5	83	164	20

BRICK STRUCTURE

20	164	83	5	83	164	20
164	255	229	132	223	255	164
83	229	163	51	159	233	83
5	132	51	0	51	132	5
83	223	159	51	158	224	83
164	255	233	132	224	255	164
20	164	83	5	83	164	20

FIG. 23c



16X16 DOT SIZE DRIVER

256	245	240	224	204	168	136	92	85	129	161	195	219	233	250	255
252	244	232	208	188	160	116	84	73	109	153	181	209	229	241	248
236	228	216	192	176	144	108	80	69	101	137	169	197	213	225	237
217	212	200	180	152	120	100	63	55	93	121	145	177	189	205	221
193	184	172	148	128	58	46	39	35	51	67	125	149	173	185	201
164	156	140	124	66	42	30	22	19	31	43	59	117	141	157	165
132	112	104	96	50	26	14	6	11	15	27	47	97	105	113	133
88	76	72	54	34	18	10	4	3	8	23	37	61	77	81	89
90	82	78	62	38	24	7	2	1	12	17	33	53	70	74	87
134	114	106	98	48	28	16	9	5	13	25	49	95	103	111	131
166	158	142	118	60	44	32	20	21	29	41	65	123	139	155	163
202	186	174	150	126	68	52	36	40	45	57	127	147	171	183	194
222	206	190	178	146	122	94	56	64	99	119	151	179	199	211	218
238	226	214	198	170	138	102	71	79	107	143	175	191	215	227	235
246	242	230	210	182	154	110	75	83	115	159	187	207	231	243	251
254	249	234	220	196	162	130	86	91	135	167	203	223	239	247	253

FIG. 24